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On the fauna of tubificids and lumbriculids (Oligochaeta: Tubificidae, Lumbriculidae) of the Chukchi Peninsula

by N.L. Sokol'skaya

The oligochaeta fauna of the Chukchi Peninsula is currently known only from the material accumulated during three years of expeditions (1972-1974) by the Laboratory of Freshwater Hydrobiology and Ichthyology of the Soil Biology Institute of the Far Eastern Scientific Centre of the USSR Academy of Sciences (Vladivostok). The number of samples containing oligochaetes is insignificant (180 samples, over 4000 specimens). They were collected from 58 bodies of water, mainly rivers and streams. The study area included the district of Zaliv Kresta (Egvekinot), the streams and lakes along the Egvekinot-Iul'tin highway, the settlement of Iul'tin, the basin of Lake Iona and the adjacent streams falling into Mechigmensky Zaliv, the area around the Lavrentiy settlement (Zaliv Lavrentiya), Uelen, Bukhta Provedeniya and Zaliv Tkachen (Chaplino thermal springs).

The most abundant (1/3 of all the samples) were the oligochaete samples from the Egvekinot area (Geologicheskiy creek, Nyrvakinotveyev creek and other streams) where one of the permanent

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research stations was located. A significant number of samples (37) was collected in the area of the Chaplino lakes (the second permanent station was located in Chaplino). The samples collected by the expeditions have given us quite a complete picture of the oligochaete fauna in certain bodies of water (the stream in the Lavrentiy settlement, the water bodies off Lake Iona and the middle lake on the 103rd km stretch of the Egvekinot-Iul'tin highway.

Naturally, the results of our study of these collections cannot be regarded as a complete coverage of the oligochaete fauna of the peninsula. They are interesting in that they pertain to an area which is part of ancient Beringia, an area which has not been studied at all as regards to the Oligochaeta.

The number of oligochaete species found on the peninsula is not very high, but this fauna is original and includes a large number of new taxa, which have already been described in the literature (Sokol'skaya, 1975, 1976a,b,c, 1977a). (121)

Systematic review of the species encountered

FAMILY TUBIFICIDAE

Subfamily Rhyacodrilinae Hrabe, 1954

1. Rhyacodrilus svetlovi Sokolskaja, 1976

Sokol'skaya, 1976b: 1094-1097, fig.

Occurrence. Lavrentiy settlement: stream, depth 0.05-0.25 m, current slow, moderate and rapid, bottom mixed (stones—large pebbles, stones—small pebbles—sand, large stones—sand—silt) (105 specimens, 52 mature, 26 June and 27-28 July 1972, collected by I.A. Chereshnev). The same stream, t=8.1° (5 specimens, 4 mature, 10 August 1973, collected by I.M. Levanidova). Lake Iona area:

channel from Lake Iona (outflow and river bed), bottom stones or gravel with sand and pebbles, t=6.9-10.3° (21 specimens, 15 mature, 5 and 6 August 1973, collected by I.M. Levanidova); Goryachiye klyuchi (Hot Springs) (12 specimens, 8 mature, 3 and 4 August 1973, collected by I.M. Levanidova); channel of the Ioniveyem R., bottom medium pebbles, current slow, t=6.6° (3 immature specimens, 7 August 1973, collected by I.A. Chereshnev). Tributary of the Amguema R. on the 105th km of the Egvekinot-Iul'tin highway, depth 0.2 m (2 mature specimens, 12 July 1972, collected by I.A. Chereshnev). Iul'tin settlement, Teplyye klyuchi R. (1 mature specimen, 28 June 1972, collected by I.M. Levanidova).

Mature specimens were noted in 1972-1973 from the end of June, in July and in August. This species is confined to stony substrates in the shallow parts of streams, sometimes with an admixture of sand and silt.

Rh. svetlovi has a primitive male gonoduct, certain features of which (a tubular atrium) make it similar to the Altaian Rh. altaianus Michaelsen (Michaelsen, 1935; Hrabe, 1974) (Sokol'skaya, 1976b).

It is known only on the Chukchi Peninsula and in the Koryak upland.

Two mature specimens of Rh. svetlovi from the Lake Iona area (Goryachiye klyuchi), which had been studied in a series of sections, differed somewhat from the type specimens of the species from the stream in the Lavrentiy settlement. They did not have an anterior seminal vesicle, the chromophiles were in segments IV and V (instead of III and IV) and the coelomocytes were somewhat larger

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(14-21.5 μm instead of 11-13). The structure of the male gonoduct and spermathecae in the specimens from the Lake Iona basin does not differ significantly from that of the holotype (the atrium was wider, 64.6 μm in diameter, and one specimen had a pseudopenis). The presence of a pseudopenis can probably be attributed to the physiological state of the specimen at the time of fixation. In connection with this, we refer to the data of A.P. Morev who was able to experimentally induce the formation of a pseudopenis in Rh. coccineus (Vejdovsky) with a 5% aqueous solution of $MgCl_2$ (written communication). The latter prompts us to be especially careful when using this character in the systematics of the genus.

2. Rhyacodrilus coccineus (Vejdovsky, 1875)

Sokol'skaya, 1976c: 92-94, fig. 2 (Rhyacodrilus leonidi).

Occurrence. Stream in the Lavrentiy settlement, depth 0.05-0.40 m, rapid current and stony bottom with an admixture of pebbles and sand, or a moderate and slow current (and then silt is added to the substrate) (61 specimens, 30 mature, 26-28 July 1972, collected by I.A. Chereshnev). Loren R., shoal, t=8.1° (1 mature specimen, 29 July 1973, collected by I.M. Levanidova). Chaplino lakes (lake No. 1), depth 0.1-0.5 m, bottom silty, t=11.3°C (2 mature specimens, 9 September 1974). Stream on the 105th km of the Egvekinot-Iul'tin highway, depth 0.2 m (10 specimens, 2 mature, end of June and July 1972, collected by I.M. Levanidova and I.A. Chereshnev).

Mature specimens noted at the end of July and the beginning of September during different years.

On the Chukchi Peninsula, the species is confined mainly to running waters with a stony bottom; it was found only once on a silty bottom in a lake; the depth does not exceed 0.5 m.

Geographic distribution: Holarctic, Australia.

Subfamily Telmatodrilinae Eisen, 1885

3. Alexandrovia ringulata (Sokolskaja, 1961)

Sokol'skaya, 1961: 61-64, fig. 5 (Peloscolex); Hrabe, 1964: 108 (Alexandrovia); Sokol'skaya, 1972: 77-78, fig. 1 (Alexandrovia); Sokol'skaya, 1976c: 94, 96, fig. 3.

Occurrence. Lake (middle) on the 103rd km of the Egvekinot-Iul'tin highway, depth 2.0-7.0 m, bottom silt with algae, sand or small pebbles, t=14-16°C (8 specimens in all, one mature; 13, 14, 25 July and 23 August 1973, collected by L.L. Budnikova). Stream on the 105 km of the highway, near the bridge. depth 1.0 m, bottom silt, detritus, sand, current slow, t=13°C (1 specimen, 8 August 1973, collected by L.L. Budnikova); the same stream, 1 km below the bridge, depth 0.2 m, shoal (1 specimen, 15 July 1972, collected by I.A. Chereshnev). Stream on the 108th km of the highway, backwater, depth 0.1-0.5 m, silt. t=9°C (1 specimen, 10 August 1973, collected by L.L. Budnikova). Ioniveyem R. (6 specimens in (123
all, 2 mature, 7 August 1973, collected by I.M. Levanidova and I.A. Chereshnev); channel of the Ioniveyem R., medium pebbles, slow current, t=6.6°C (7 specimens, 7 August 1973, collected by I.A. Chereshnev). Area of Chaplino lakes: Itkhat R., river bed with slow current, 50 m from the point where it runs into the main river bed (1 specimen, 28 August 1974); a stream, 20 m from the point where it falls into Lake Naivan, t=13.5°C (2 specimens,

6 August 1974); lake, depth 0.2 m, silt (1 specimen, 9 September 1974); lake (1 specimen, 4 August 1974); small stream falling into Svetlyi R. (14 specimens, 5 August 1974). River in the Lavrentiy settlement, depth from 0.05 to 0.5 m, current slow, moderate or rapid, bottom mixed (stones—pebbles—sand or stones—sand—silt) (54 specimens in all, 25 mature, 26 June and 26-28 July 1972, collected by I.A. Chereshnev).

Mature specimens noted in 1972 and 1973 at the end of June and July and at the beginning of August.

A. ringulata was encountered in streams and in lakes. In streams and channels, it was found on various bottoms, i.e. silty (with detritus and a mixture of sand), mixed, with a stony base (stones—pebbles—sand; stones—sand—silt), as well as on pebbles alone. The depth in running waters varied from 0.5 to 1.0 m. In lakes, the species is usually found on a silty bottom, frequently with an admixture of sand and small pebbles, sometimes in overgrowths of algae, up to a depth of 7.0 m.

Additions and corrections to the description of the species are given in a paper by N.L. Sokol'skaya (1976c). The following are comments regarding the morphology of the Chukchi specimens of the species.

There are 3-6 pubescent hairlike setae to a bundle in the anterior segments. The dorsal acicular setae have thin parallel teeth 2 μm long on the distal end. The acicular setae measure 40-60 μm in length, and number 3-6 to a bundle in the anterior segments. The ventral bundles of the anterior segments each contain 2-5 setae which measure 117-141 μm in length on segments II-IV.

The spermathecal setae are identical in form to those of A. onegensis Hrabe, 1962 from Lake Onega (Hrabe, 1964) and Alaska, according to Holmquist (1974b). The maximum length of the spermathecal setae in the Chukchi worms is 168 μm. As suggested earlier (Sokol'skaya, 1976c), A. onegensis should be regarded as a synonym of A. ringulata.

Geographic distribution: northern part of Eurasia, northern Alaska.

FAMILY LUMBRICULIDAE

4. Lumbriculus olgae Sokolskaja, 1976

Sokol'skaya, 1976a: 48-51, fig; 1976c: 96-97.

Occurrence. Stream in the Lavrentiy settlement, depth 0.05-0.3 m, bottom sand and large pebbles with stones (10 specimens, 7 mature, 27 July 1972, collected by I.A. Chereshnev). Stream (tributary of the Amguema R.) in the vicinity of the 105th km of the Egvekinot-Iul'tin highway, depth 0.2 m (3 specimens, 2 mature, 12 July 1972, collected by I.A. Chereshnev). Stream on the 108th km of the highway, backwater, depth 0.10-0.50 m, silt, $t=9^{\circ}C$ (2 specimens, 1 mature, 10 August 1973, collected by L.L. Budnikova).

The specimen from around the 108th km of the highway differed from the type specimen (Sokol'skaya, 1976a) in that it had somewhat smaller dimensions of the atrium and other parts of the male gonoduct. Diameter of atrium - 112 μm, thickness of muscular layers of atrial wall - 21.6 μm (circular - 6.5, longitudinal - 15.1), height of epithelium of atrial cavity - 1.3 μm. Length of penial bursa - 64.6 μm, proximal diameter - 17 μm.

In her paper on the lumbriculids of Northern Alaska and Northwestern Canada, Ch. Holmquist (1976) re-established the genus Thinodrilus Smith, 1895, which the author of the genus had reduced to a synonym of Lumbriculus Grube, 1884 (Smith, 1905). By re-establishing the genus Thinodrilus, Holmquist attaches primary taxonomic importance to the presence in its members of two pairs (anterior and posterior) of sperm funnels and vasa deferentia which fall into one pair of atria, whereas the atria in all the species of Lumbriculus are joined only with the posterior vasa deferentia, and if there are anterior sperm funnels and vasa deferentia, they are not joined with the atrium (do not function).

The interrelation of the sperm funnels, vasa deferentia and atria is very important in the generic taxonomy of the Lumbriculidae. However, we believe that the taxonomic importance of this character should be evaluated differently within the genus Lumbriculus (s. lat.) which is distinguished by remarkable variability of the reproductive system (the location, number and interrelation of its components). In her paper, Holmquist, when describing the new species Th. ambiguus, gives the structural variants of its reproductive system and notes the specimens with only a posterior pair of sperm funnels and vasa deferentia (Holmquist, 1976; p. 409, fig. 19B, paratype). In his well-known study of the reproductive system of L. variegatus (Müller), Mrazek (1907) encountered specimens with 2 pairs of testes, sperm funnels and vasa deferentia with one pair of atria (true, he did not find that the vasa deferentia were joined with the atrium, which Holmquist particularly stresses). If the anterior vasa deferentia did lose their contact

with the atria in this case, one cannot help considering this variant as a transitional stage in the genus Lumbriculus. With this type of variability of the reproductive system, the independence of the genus Thinodrilus must be confirmed by a morphological analysis of the male gonoduct (structure of the atrium and penial apparatus). However, the structure of these parts is quite similar in the species known to us. The form of the atrium produces a number of transitions; Holmquist herself (1976) stresses the similarity of the structure of their penial apparatus with an ejaculatory duct lined with a high epithelium and the thin cuticularized penis, i.e. points out even the histological similarity. The location of the spermathecal pores in the Lumbriculus reveals a consecutive series: from the line of the ventral setae (usual location for Lumbriculidae) in L. tetraporophorus Popchenko, 1976, or slightly more laterad (L. olgae), in the lateral line (L. genitosetosus Holmquist, 1976), or more dorsally up to the line of the dorsal setae (L. alexandrovi Popchenko, 1976). The above facts do not permit us to agree with Holmquist's re-establishment of the genus Thinodrilus; we regard it as a synonym of Lumbriculus.

One of the species described in Alaska, L. genitosetosus, displays a certain similarity to the Chukchi species L. olgae. These species have the same location of the testes, sperm funnels and spermathecae, and a similar form of the atrium and structure of its walls with two well-developed layers of muscles (circular and longitudinal). The species have the same number of larval segments and a similar location of the chromophiles (in segments III-IV in L. olgae, and in segments III-IV in the second species).

L. olgae and L. genitosetosus are easily differentiated by the location of the spermathecal pores, which are found in the lateral line in the second species, and by the presence of penial setae in the species from Alaska, which is an exceptional phenomenon among the Lumbriculidae.

5. Trichodrilus itchaensis Sokolskaja, 1973

Sokol'skaya, 1973: 1714-1716, fig.

Occurrence. Egvekinot, Nyrvakinotveyem creek, depth 0.1 m, bottom pebbles and sand, current moderate (1 mature specimen, 21 July 1973, collected by I.A. Chereshnev). Svobodnyi Zaliv, a stream 1 km from the lake, shoal, slow current (12 specimens, 2 mature, 17 August 1974, collected by I.A. Chereshnev). Area of the 108th km of the Egvekinot—Iul'tin highway, right tributary of the Gytkhytkhvovuvaama R., upper part of the stream (13 specimens, 2 mature, 22 July 1974). Channel from Lake Iona, depth 0.2 m, stony bottom with sand and pebbles (81 specimens in all, 60 mature, 5-6 August 1973, collected by I.M. Levanidova and I.A. Chereshnev). Area of Chaplino lakes: streams falling into Lake Naivan (4 specimens, 3 mature, 6 August 1974); Krasnyi creek, on a pebble bed (1 mature specimen, 6 September 1974); streams falling into the Svetlyi R. (27 specimens, 4 mature); Itkhat R., lower part (1 mature specimen, 28 August 1974. collected by T.S. Vshivkova). (126)

Mature specimens noted in 1973 and 1974 from 21 July to 6 September.

Encountered only in running waters, in shallow parts (depth 0.1-0.2 m), on pebble beds (sometimes with an admixture of sand), or on a stony bottom with sand and pebbles.

The species was first described from Kamchatka on the basis of a single mature specimen. Because of this, we consider it necessary to give a description of the worms from the Chukchi Peninsula, collected at different points and differing in body dimensions. We have serial sections of 3 specimens (from a stream in Svobodnyi Zaliv, the right tributary of the Gytkhytkhvovuvaama R. and the channel leading from Lake Iona). The specimens studied differ in the starting point of the secondary annulation of the anterior segments (from segment III or segment IV), the presence of the anterior seminal vesicle (in one specimen), and in the location of the chromophiles (in segments III-V or III-VI). The dimensions of parts of the male gonoduct also vary considerably.

Description. Prostomium short, cup-shaped; ratio of its length to width of base 30:52, 37:60, 26:54; absolute length from 280-400 μm. Anterior segments, beginning with III or IV, with secondary annuli (narrow anterior ring 4-5 times narrower than setaceous posterior one). Setae S-shaped, not toothed, with distal nodule. Thickness of layers of body wall in segment XIV: epidermis from 6.4 to 8.6-10.7 μm, longitudinal layer of muscles 34.4-38.7 μm.

Pharynx in segments II-IV, chromophil cells in segments III-V or III-VI; in second case, accumulation of chromophiles in segment III insignificant. Chloragogue tissue begins in segment VI. Postseptale of anterior nephridium in segment VII. Nephridia also present in segments VIII-XV. Nephropores open in front of ventral bundles of setae.

Clitellum occupies segments 1/n IX-XIII. One pair of male pores on segment X, in the line of ventral setae, at midpoint

between the bundles of setae and intersegmental furrow X/XI. One pair of female pores in intersegmental furrow XI/XII, in the line of ventral setae. One pair of spermathecal apertures on segment XI behind ventral bundles of setae (closer to the corresponding bundles than the male pores).

Two pairs of testes in segments IX and X. One pair of ovaries in segment XI. Two pairs of sperm funnels on anterior surface of dissepiments IX/X and X/XI. Dorsoventral diameter of anterior sperm funnels 142-150 μm, posterior ones 193 μm. Vasa deferentia of posterior pair perforate dissepiment X/XI and form a loop in segment XI. Diameter of vasa deferentia in distal part 17.2-21.5 μm. Thickness of vasa deferentia sometimes uniform throughout, proximal end often slightly narrower. Anterior and posterior vasa deferentia enter distal part of atrial ampulla from opposite sides, intersect muscular layer of its wall proximally at the boundary of the muscular layer and the epithelium of the atrial cavity. Vasa deferentia fall into atrial cavity in the middle third of the atrial ampulla (at the boundary of the proximal or distal parts of the ampulla). Atria (1 pair) in segment X with a cylindrical, somewhat laterally compressed thick-walled ampulla from 154 to 300-322 μm in length, with a maximum diameter of 112-150 μm. Ratio of ampulla length to its diameter varies considerably (from 1.3 to 2-2.1). Thickness of muscular layer of ampulla wall also varies, from 17-21 to 26-34 μm; ratio of thickness of muscular layer to diameter of ampulla ($\frac{m}{d}$) varies from 0.18-0.20 to 0.23. Narrowing, distal part of atrium passes into atrial duct measuring from 21-35 to 52-69 μm in length, with a proximal diameter of

(127)

26-47 μm; muscles of duct wall well-developed (thickness 4.3-6.4 μm). Atrial duct ends in penis with cuticular sheath, 30-34 μm in length and about 39 μm in diameter at the base.

One pair of egg funnels on anterior surface of dissepiment XI/XII. One pair of spermathecae in segment XI, with oval-sacciform ampulla and well-delineated duct 129-168 μm in length, consisting of a wide cylindrical proximal part and a somewhat shorter conical distal part. Anterior seminal vesicle (from dissepiment VIII/IX, in segment VIII) not in all specimens.

The studied specimens of T. itchaensis from the Chukchi Peninsula are distinguished from the holotype by the starting point of the secondary annulation (from segment III or segment IV) and by the location of the chromophil cells (in segments IV-VI in the holotype), displaying the above-mentioned variations in this feature. The much weaker prostatic lining of the atrium in the Chukchi worms in comparison with the holotype is probably due to the stage of sexual maturity. The holotype occupies the end position in the established variation series (ratio of the length of the atrial ampulla to its diameter 1.25) with respect to the form of the atrium; the thickness of the atrial wall muscles and the m/d ratio are the highest for the species (39 μm and 0.28), and the dimensions of the atrium are of an average value (length 252 μm, maximum diameter 206 μm).

6. Stylodrilus (Bythonomus) chukotensis Sokolskaja, 1975
Sokol'skaya, 1975: 116-119, fig.

Occurrence. Lake on the 95-96th km of the Egvekinot-Iul'tin highway, on dead plants (2 mature specimens, 8 July 1973, collected

by L.L. Budnikova). Stream in the vicinity of the 105th km of the highway, 1 km from the bridge, shoal, depth 0.2 m (2 specimens, 1 mature, 15 July 1972, collected by I.A. Chereshnev); stream near the highway workers' settlement (3 specimens, 2 mature, 27 June 1972, collected by I.M. Levanidova). Channel from Lake Iona, depth 0.2 m (19 specimens in all, 5 mature, 5 August 1973, collected by I.A. Chereshnev, 6 August 1973, collected by I.M. Levanidova). Loren R., shoal (5 mature specimens, 29 July 1973, collected by I.M. Levanidova).

Mature specimens noted in 1972 and 1973 from 27 June to 6 August.

A study of serial sections of two mature specimens from the lake on the 95-96th km of the Egvekinot-Iul'tin highway has enabled us to expand our data on the structure of the reproductive system of the species, and to present the dimensions of its parts. The thickness of vasa deferentia which are uniform throughout is 21.5-25.0 μm. The anterior pair of vasa deferentia is thinner (17.2 μm) in one specimen. The length of the oviform atria varies (147-154 and 190-194 μm) with an almost constant maximum diameter (121-134 μm). The atrial wall consists of large glandular cells which line the atrial cavity (thickness of layer 12.9-17.2 μm), a well-developed layer of circular muscles 8.6 μm thick, and a prostatic lining (up to 108 μm). The m/d ratio is equal to 0.06-0.07 (0.1 in the holotype). The anterior and posterior vasa deferentia enter the distal part of the atrial ampulla from opposite sides (from the front and back) and extend almost horizontally towards each other in the muscular layer of its wall, falling into

the atrial cavity next to each other on the medial wall at the boundary of the distal third of the ampulla. The atrial duct measures 42-49 μm and the penis 14-21 μm with a proximal diameter of 13 μm. The spermathecae have an oval ampulla (246x151 μm) and a comparatively short duct 52 μm in diameter.

The thickness of the layers of the body wall in segment XV is very close to that of the holotype: epidermis 12.9 μm, circular muscles 2.1 μm, longitudinal muscles 12.9 μm (13.2, 2.2 and 13.2 μm respectively in the holotype).

The specimens studied differed from the holotype in that they had a longer conical prostomium, the chromophil cells were found in segments IV-VI instead of segments IV-V, and the epithelium lining the atrial cavity was highly developed and of a glandular nature. The latter can be attributed to the physiological state of the reproductive system. (129)

In the opinion of Ch. Holmquist (1976) who has studied our serial sections of S. (B.) chukotensis, this species is similar to the one found by her in three lakes of Northern Alaska (two at the northern tip of the Seward Peninsula and one in the Noatak R. basin), S. (B.) sovaliki Holmquist. The species differ in a number of features of the male gonoduct, i.e. a thicker muscular layer in the wall of the atrium and atrial duct, a more ectal entry of the vasa deferentia into the atrial cavity, as well as the presence of a penis in S. (B.) chukotensis; the vasa deferentia in S. (B.) sovaliki open into the atrial cavity at its middle (as in S. (B.) mirus Cekanovskaja from the Yenisei R. (Chekanovskaya, 1956), while in S. (B.) chukotensis they open into the atrial cavity near

the boundary of the distal one-third. However, we should point out the similarity of some of the details which may be an indication of the genetic relationship of these species, i.e. the anterior and posterior vasa deferentia in both species open into the atrial cavity through the medial wall and close to each other.

There is still no unanimous opinion regarding the size of the genus Stylodrilus Claparéde, 1862. The outstanding systematist of the Oligochaeta, S. Hrabe (1929, 1970), who has almost all of the known species of Stylodrilus and Bythonomus Grube, 1880 at his disposal, regards them as independent genera. In the genus Bythonomus he places the species with unforked setae, with vasa deferentia that fall into the atrial cavity in the distal half of the atrium (from the basal to the medial part), and with (excluding B. sulci Hrabe, 1934) two pairs of lateral blood vessels with numerous cecal appendages or bifurcate vessels. In O.V. Chekanovskaya's key (1962, p. 356), Stylodrilus and Bythonomus are given as separate genera, though the author notes their indistinct separateness, and bases the diagnoses on the type of setae for reasons of practical convenience. Having studied the type species of these genera (S. heringianus Claparéde and Bythonomus lemani (Grube)), as well as the Alaskan B. sovaliki and the Chukchi species S. chukotensis, Holmquist is certain that these are independent genera. Holmquist opposes the subgeneric status of these taxa.

R.O. Brinkhurst (1965) and D. Cook (1971) are of the opposite opinion; they combine the two genera under the name Stylodrilus on the basis of the structure and location of the reproductive

system, claiming that a broad understanding of Stylodrilus better reflects the genetic interrelations of the species. Cook (1975) considered it possible and useful to establish Stylodrilus and Bythonomus as subgenera.

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We consider this acceptable, since the form of the atrium and the structure of the penis display a successive series of transitions in Stylodrilus (s. lat.), the same as the point of entry of the vasa deferentia into the atrial cavity; the latter is confined to the proximal half of the atrium (from the apex to the median line) in Stylodrilus (s. lat.) and to the distal part (from the base to the median line) in Bythonomus. The qualitative differences between the species of these taxa are seen in the form of the setae and in the structure of the lateral blood vessels. The form of the setae is of lesser phylogenetic importance than the structure of the male gonoduct. The circulatory system can obviously play an essential role in this respect, but a detailed analysis is required in each individual case. The differences in the structure of the lateral blood vessels of the middle and posterior body segments in the species of Stylodrilus (s. str.) and Bythonomus lie in the absence of branching or bifurcate vessels in the first, whereas they are present in the majority of the species of the second genus, although lateral vessels are not found in B. sulci Hrabe, 1934 and B. beattiei Cook, 1975. Both species were encountered in cave waters (the first in Yugoslavia, the second in West Virginia, USA), and so we can assume that the observed reduction of the circulatory system is due to the cave environment. However, the lability of this feature, which is observed in the given case, prompts us to act with caution when

using it to differentiate the genera. The form of the setae is the only feature left to tell these taxa apart. We consider this insufficient for differentiating genera, but quite acceptable for establishing subgenera.

7. Styloscolex (Neoscolex) macer Sokolskaja, 1976

Sokol'skaya, 1976a: 45-48, fig. 1-2; 1976c: 97-98.

Occurrence. Stream in the Lavrentiy settlement, 1.8 km from the mouth, depth 0.15 m, bottom stones, small pebbles and sand; current rapid (3 incomplete specimens, 27 July 1973, collected by I.A. Chereshnev).

8. Styloscolex (Neoscolex) levanidovi (Sokolskaja, 1977)

Sokol'skaya, 1977a: 296-299, figs. 1-2, 3 (Eclipidrilus).

Occurrence. Egvekinot: Geologicheskiy creek, depth 0.05-0.25 m, bottom pebbles and stones; water temperature 0.6-3.6°C (38 specimens, 1-2 July 1972, collected by I.M. Levanidova; 96 specimens, 20 July 1973, collected by I.A. Chereshnev and L.L. Budnikova); Nyrvakinotveyem creek and its right branch, depth 0.05-0.35 m, bottom usually sand and pebbles, as well as sand and large stones, sometimes in overgrowths; current slow, moderate or rapid, temperature 5.1-5.6°C (8 specimens, 22 June and 6 July 1972, collected by I.M. Levanidova and I.A. Chereshnev; 488 specimens, 7 mature, 21 July 1973, collected by I.A. Chereshnev). In the vicinity of the 13th km of the Egvekinot—Iul'tin highway, a creek with (131) moss pads, t=2.8°C (5 specimens, 3 mature, 25 July 1972, collected by I.A. Chereshnev).

Worms with well-developed clitella were noted on 6, 21 and 25 July 1972 and 1973. The specimens did not have fully developed

clitella at the end of June and beginning of July, but the genital pores were well-defined.

The species has a limited distribution, and has been noted only in the small streams of Egvekinot and in a stream on the 13th km of the Egvekinot—Iul'tin highway. It was found in shallow water (depth from 0.05 to 0.35 m), predominantly on a stony and pebbly bottom, sometimes with an admixture of sand; it was encountered only once in a creek with moss pads. The habitats of the species are characterized by low temperatures, minimal ones in the Geologicheskiy creek (0.6-3.6°C) and slightly higher in Nyrvakinotveyem (5.1-5.6°C).

The material studied after the species had been described (Sokol'skaya, 1977a), including 5 series of sections, enabled us to introduce corrections and additions. A second analysis of the atrial wall showed that the spiralling of the muscle fibres noted in the first description and their partial intersection should be attributed to the curvatures of the atrium; therefore, it would be incorrect to assign the species to the genus Eclipidrilus Eisen. The location of the reproductive system (testes, sperm funnels, distal part of atrium and male pores in segment VIII, ovaries in segment IX) corresponds to the subgenus Neoscolex. The form of the long cylindrical, somewhat curved atrium which extends into segments XI-XII and the thickness of its wall with a thick muscular layer are reminiscent of some of the Baikal species of Styloscolex (s. str.) such as S. (S.) asymmetricus Isossimov, 1962 (Izosimov, 1962).

Addendum to species description. The first of the secondary annuli of the anterior segments is 3.5-5 times narrower than the setaceous posterior one. The clitellum is found in segments VII-1/n XI, the pharynx in segments II-IV, and the chromophil cells in segments III-VI (accumulation of cells in segment VI often much smaller than in preceding segments). The chloragogue tissue begins from the end of segment V or from segment VI. The post-septale of the anterior nephridium is in segment VII. The location of the gonads, the sperm and egg funnels and the genital pores corresponds to the description (Sokol'skaya, 1977a). One pair of long cylindrical, somewhat contorted atria is found inside the seminal vesicles in segments VIII-XI or VIII-XII. The atria measure 1.4-2.5 mm in length and 129-272 μm in diameter. The walls of the atrial ampullae are thick (30-60 μm), with a thick muscular layer (26-47 μm). The thickness of the atrial wall and its muscular layer varies considerably in specimens of different size. The ratio of the thickness of the muscular layer of the atrial wall to its diameter ($\frac{m}{d}$) varies from 0.18 to 0.25. The penis is long, conical, and found in a cylindrical penial bursa 517-528 μm in length and about 77 μm in diameter. The cuticular penial tubule consists of a basal part which narrows slightly distally (proximal diameter 17-21 μm, distal diameter 13 μm) and a very thin end portion. The penis and tubule can be partially or completely retracted into the penial bursa. (132)

The diameter of the sacciform spermathecal ampulla, which sometimes extends into the segment adjacent to VII, is equal to 310-482 μm. The spermathecal duct is clearly delineated from the ampulla, long, proximally narrow (39-66 μm), with thick walls

(13-26 μm) and a narrow canal (9-14 μm). In the distal half, the spermathecal duct expands to 64-97 μm and its walls become glandular; the end portion of it narrows in the form of a cone. The thickness of the layers of the body wall varies in segment XV, but consistency is observed in the following: the thickness of the epidermis and the longitudinal muscles is the same, while the circular layer is about half as thick as they are. The epidermis is 8.6-17.2 μm thick, the circular layer 4.3-6.5 μm, and the longitudinal layer 8.6-17.2 μm thick. The paired seminal vesicles begin from dissepiment VIII/IX and reach segments XVI-XVII; the paired ovisacs extend from disseptiment IX/X to XX-XXI.

S. (N.) levanidovi is distinguished from the known species of this subgenus by the presence of a cuticular penial tubule, a thick muscular layer in the atrial wall, and by the presence of an expanded part with glandular walls in the middle part of the spermathecal duct.

Due to the inclusion of S. (N.) levanidovi in the subgenus Neoscolex and taking into account the characteristics of S. (N.) sokolskajae described from the Chaun R. basin by A.P. Morev (1978) (reproductive system in this species offset anteriorly by one segment), we have introduced changes in the diagnosis of the subgenus.

Subgenus Neoscolex Sokolskaja, 1976

Diagnosis. One pair of testes, sperm funnels, vasa deferentia and male pores in segment VIII or segment VII[1]. One pair of ovaries in segment IX or segment VIII[1]. No sterile segment between the

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[1] In S. (N.) sokolskajae Morev (reproductive system offset anteriorly by one segment).

segments with the testes and ovaries. Cuticular penial tubule present or absent. One or two pairs of spermathecae open on segment VI[1] or VII (in the case of one pair), or on segments VI and VII (with 2 pairs).

The characteristics of the Neoscolex species are compared in Table 1.

(134)

Key to the species of Neoscolex

1 (2) Reproductive system offset anteriorly by one segment (♂ pores on segment VII). Clitellum in segments 1/n VI-XII..... N. sokolskajae Morev

2 (1) Reproductive system in usual location (♂ pores on segment VIII). Clitellum on segments VII-1/n XI.

3 (4) One pair of spermathecae opening on segment VII. Male pores on porophores. Retractile cuticular penial tubules present. Atria very long (1.4-2.5 mm), cylindrical, with a thick wall..... N. levanidovi (Sokolskaja)

4 (3) Two pairs of spermathecae opening on segments VI and VII. No porophores or penial tubules. Atria short (382 μm), sacciform, with a very thin wall.... N. macer Sokolskaja

A comparison of the structure of the atria in the species of Styloscolex (s. str.) and Neoscolex reveals parallel complication of the structure of the organ in the subgenera (elongation of the atrium and thickening of its walls due to the muscular layer). In the subgenus Styloscolex, this is observed in S. opisthothecus Sokolskaja with its sacciform atria located in segments VIII-IX (length 400 μm) and very thin wall (thickness of muscular layer 4 μm, m/d=0.04), S. tetrathecus Burow with the same extension of the atria (segments VIII-IX, length 251 μm) but with a much thicker wall (thickness of muscular layer 17.6 μm, m/d=0.12), and finally

(135)

[1] see footnote on previous page - transl.

S. asymmetricus Isossimov with its long sausage-like atria in segments VIII-XI, which have thick walls with a well-defined muscular layer (length of atrium and thickness of layer not indicated) (Izosimov, 1962). Approximately the same stages of complication of the atrium can be observed in the species of Neoscolex. The sacciform atria in N. macer are found in segments VIII-X (length 382 μm) and they have a very thin wall (thickness of muscular layer 2.2 μm, m/d=0.01). The sacciform atria in N. sokolskajae occupy segments VII-IX (length 517-1265 μm) and their walls are fairly thick (thickness of muscular layer 22-26 μm, m/d=0.11-0.12). The cylindrical atria in N. levanidovi are the longest and occupy the largest number of segments (1400-2500 μm long, segments VIII-XII), and the walls are even thicker (muscular layer 26-47 μm thick, m/d=0.18-0.25).

9. Styloscolex (Neoscolex) sp.

Occurrence. Stream in the Lavrentiy settlement, 1.5 km from the settlement, depth 0.15 m, current moderate, t=15.6°C (3 incomplete specimens, 1 mature, 27 July 1972, collected by I.A. Chereshnev).

The mature specimen available to us is similar to S. (N.) macer in the structure of the male gonoduct. It has short thick-walled vasa deferentia and a sacciform thin-walled atrium found in segments VIII-IX. The main differences from the indicated species are the presence of only one pair of spermathecae with a pore in segment VII and the location of the postseptale of the anterior nephridium in segment VI. The limited material on S. (N.) macer (3 incomplete specimens) does not permit us to form an

opinion on its variability by the number of spermathecae; however, the tendency towards a reduction of the anterior pair is apparent in the specimens studied, i.e. the anterior pair of spermathecae has much smaller (and empty) ampullae. The location of the anterior nephridia has been established from a series of sections of the only specimen available. Therefore, we are not certain whether this was an irregularity occurring in one specimen, or whether this is a feature characterizing species organization, which determines the number of larval segments and is very important in taxonomy. All this prompts us to regard the specimens found by us as Styloscolex (Neoscolex) sp., and to present the following brief description of them. (136)

Description. Prostomium wide, cup-shaped, without appendages; ratio of length to width of base 17:22, absolute length 307 μm (fixed specimens). Secondary annulation of anterior segments present. Setae S-shaped, distal end not toothed. Clitellum on segments VII-X, highly convex. Genital pores in the line of ventral setae: 1 pair of male pores on segment VIII near the posterior intersegmental furrow, 1 pair of female pores in intersegmental furrow IX/X; 1 pair of spermathecal apertures on segment VII behind ventral bundles of setae.

Pharynx in segments II-III, chromophil cells in segments III, IV and V. Postseptale of anterior nephridium in segment VI.

Reproductive system. 1 pair of testes in segment VIII and 1 pair of ovaries in segment IX. 1 pair of sperm funnels in front of dissepiment VIII/IX, vasa deferentia enter segment IX and then go back into segment VIII. Diameter of vasa deferentia about 30 μm,

thickness of wall 4.3 μm. 1 pair of egg funnels in front of dissepiment IX/X. 1 pair of atria in segments VIII-IX. Atria sacciform, 327 μm in length, maximum diameter 129 μm, walls thin; height of epithelium of atrial cavity about 1-2 μm, thickness of muscular layer of wall 4.3-6.5 μm. Narrowing, distal part of atrium passes into long penis which is found in a penial bursa. No cuticular penial tubule. 1 pair of spermathecae with oval ampulla (in longitudinal sections) (length 353.4 μm, maximum diameter 194 μm) and a long well-delineated duct, 1 pair of posterior seminal vesicles extending from dissepiment VIII/IX and 1 pair of ovisacs extending from dissepiment IX/X.

The reproductive system was described from a specimen with its atria and spermathecae filled with spermatozoa.

10. Rhynchelmis sp?

Occurrence. Svobodnyi Zaliv, a stream 1 km from a lake, shoal, current slow (2 fragments of immature specimens, 17 August 1974, collected by I.A. Chereshnev).

The material found consists of 2 fragments of the anterior regions with the prostomium bearing a proboscis 0.7-0.8 mm long and setae with no teeth.

Ch. Holmquist (1976) indicates three species of Rhynchelmis for Alaska; two of them, Rh. alaskana Holmquist and Rhynchelmis sp., have setae without teeth. The fragments found on the Chukchi Peninsula are reminiscent of Rhynchelmis sp. from Alaska in the form of the setae and prostomium, but they do not have the cross-striation on the surface of the proboscis noted in the two mentioned species. The identicalness of the Chukchi and Alaskan (137)

worms is still open to question. We question the generic assignment of the worms because the fragments available to us showed no traces of sexual maturity.

11. Lumbriculidae g. sp.

In addition to L. olgae, we came across immature worms with forked setae and a reduced distal tooth. They were distinguished from L. olgae by a much larger size (body length 30-43 mm, diameter 1.5 mm) and a large cup-shaped, turbinate or conical prostomium. The degree of reduction of the distal tooth of the setae varies (the distal end sometimes appears to be almost a straight point).

Occurrence. Svobodnyi Zaliv, a lake, silty bottom (9 specimens and fragments, 23 August 1974, collected by I.A. Chereshnev). A lake on the 95-96th km of the Egvekinot—Iul'tin highway, on dead plants (2 specimens, 8 July 1973, collected by L.L. Budnikova). Lavrentiy R. (3 specimens, 10 and 23 August 1973, collected by I.M. Levanidova). Area of Chaplino lakes: Lake Teploye and the stream flowing out of it, depth 0.3-0.4 m, silt (3 specimens, 6 August 1974); Goryachiye klyuchi, depth 0.2 m, t=5.6°C (7 specimens, 4 August 1974).

The first processed material on the oligochaeta fauna of the Chukchi Peninsula includes 11 species of Tubificidae and Lumbriculidae, several species of Enchytraeidae not discussed in this paper and Haplotaxis sp. (fam. Haplotaxidae). Considering the severe natural conditions of the peninsula, the limited species composition is not surprising (Levanidov, Levanidova, 1976). It suffices to mention its geographical latitude in the permafrost

zone, the short summer period, and the winter freezing and summer drying out of many of the water bodies.

The oligochaete fauna of the Chukchi Peninsula displays features of originality. According to our data, only five of the species of Tubificidae and Lumbriculidae known in this region are found beyond the boundaries of the peninsula. These include Rh. coccineus which has a broad range, A. ringulata which is a northern Eurasian species found in Northern Alaska, T. itchaensis which is noted in Kamchatka and the Koryak upland, and two species which are common to the Chukchi Peninsula and the Koryak upland, Rh. svetlovi and S. (B.) chukotensis. Three of these species are arbitrarily regarded as endemic to the peninsula. Special attention should be paid to the endemic species of the subgenus Neoscolex, S. (N.) macer and S. (N.) levanidovi, which are distinguished by exceptional characteristics within the genus Styloscolex (the absence of a sterile segment between the segments with the testes and ovaries), characteristics which have prompted us (138) to single them out in the subgenus Neoscolex (Sokol'skaya, 1976a). The presence of the mentioned sterile segment in the species of Styloscolex (Michaelsen) was regarded as the main character of this genus, which distinguished it from all the other genera of the family Lumbriculidae. Therefore, in Neoscolex we see the connecting link between Styloscolex (s. str.) and other genera of the Lumbriculidae, and we regard the species of this subgenus as ancient. The discovery of these ancient forms confirms the fact that the Chukchi Peninsula is a refugium of such species, and is consistent with the evergrowing conception that there has never been any glaciation in the history of this region. Having analyzed the floristic data, B.A. Yurtsev

(1974) denies that there was even semi-glacierization in this region at the peak of the Quaternary Period.

The other endemic element, L. olgae, is similar to L. genitosetosus Holmquist from Northern Alaska.

The species which are common to the Chukchi Peninsula and the Koryak upland and are not known beyond the boundaries of these regions display various relationships. In Holmquist's and our own opinion, S. (B.) chukotensis is similar to the Alaskan species S.(B.) sovaliki Holmquist. Both species are similar to S.(B.) absoloni Hrabe from the Moravian karst in the structure of the male gonoduct (Sokol'skaya, 1975; Holmquist, 1976). Rh. svetlovi displays certain primitive features in the structure of the male gonoduct, some of which (tubular atrium) make it similar to the Altaian species Rh. altaianus Michaelsen.

The nearctic relations of the Chukchi fauna of oligochaetes have not been established to the fullest extent, but they definitely should be quite tangible in connection with the recent separation of the Asian and North American continents. So far, we can mention A. ringulata, a species of Eurasian origin which has found its way into the water bodies of Northern Alaska via the Beringian bridge, as well as a number of species similar to the Alaskan ones (the above-mentioned L. olgae and S.(B.) chukotensis).

A comparsion of the data on the oligochaete fauna of the Chukchi Peninsula, the fairly well-researched Kamchatka (Michaelsen, 1929; Sokol'skaya, 1961, 1964, 1971, 1972a,b, 1973a,b, the paper in this collection) and the Koryak upland brings us to the following conclusions: of the 44 species noted altogether in

Kamchatka and the Koryak upland, only five have been encountered on the Chukchi Peninsula; they are Rh. coccineus, Rh. svetlovi, A. ringulata, T. itchaensis and S.(B.) chukotensis. Furthermore, three of these five species are not known beyond the boundaries of the Chukchi Peninsula, the Koryak upland and Kamchatka. In these regions we find representatives of the East Asian genus Styloscolex which was recently discovered in Northern Alaska by Holmquist (1974a). However, this genus is represented by different subgenera here, i.e. by Styloscolex (s. str.) in Kamchatka, the Koryak upland and Alaska, and by Neoscolex on the Chukchi Peninsula. Styloscolex (s. str.) has a wide range (lake Baikal, NE Chine, the Japanese islands, Kamchatka, the Koryak upland and northern Alaska), while Neoscolex is noted only on the Chukchi Peninsula and in the basins of the Anadyr and Chaun rivers, according to the data of A.P. Morev (1978). S.(S.) opisthothecus Sokolskaja is common and Styloscolex (S.) sp. has been encountered in Kamchatka (Sokol'skaya, 1977b), and S.(S.) tetrathecus Burow is found in the water bodies of the Koryak upland. Two species, S.(N.) macer and S.(N.) levanidovi, are encountered on the Chukchi Peninsula, and A.P. Morev discovered the new species of the subgenus, S.(N.) sokolskajae, in the basins of the Anadyr and Chaun rivers. (13

The originality of the oligochaete fauna of the Chukchi Peninsula distinguishes it from the fauna of the majority of groups of aquatic invertebrates studied in this region, i.e. the stoneflies (Levanidova, Zhil'tsova, 1976), May-flies and caddis-flies (Levanidova, 1976), midges (Makarchenko, 1976) and leeches (Lukin, 1976), which are characterized by the predominance of the common palearctic and holarctic species. Even closer to the oligochaetes in this

respect are the lower crustaceans which on the Chukchi Peninsula display a certain zoogeographic independence, according to the data of N.A. Gur'yeva (1976).

Speaking of the originality of the oligochaeta fauna of the Chukchi Peninsula on the basis of the material processed, we should take into account that mostly running waters were studied, and, considering the specific nature of the natural conditions of the region, they do not represent the optimal conditions for this particular group of hydrobionts. The systematic collections probably did not cover some of the biotopes conducive to the development of oligochaetes. Some of the common ubiquitous species noted, for example, by A.P. Morev (1974, 1975) from the Anadyr Basin, may have been missed. We should also note the significant variability of the Chukchi oligochaetes Rh. svetlovi, T. itchaensis, S.(B.) chukotensis and S.(N.) levanidovi in a number of characters (see systematics), which can be regarded as the prerequisite of active speciation.

The water bodies of the northernmost areas of the Chukchi Peninsula (Cape Schmidt, Vankarem) do not contain oligochaetes. Their northernmost habitats (of the ones studied) are in the vicinity of Uelen where several species of Enchytraeidae and one immature specimen of Lumbriculidae have been encountered (Nalednyi creek).

The majority of oligochaete species on the Chukchi Peninsula displays a scattered distribution, being encountered in the more explored areas. This is particularly evident in the species with ranges that exceed the boundaries of the peninsula, i.e. Rh. coccineus, A. ringulata and T. itchaensis (see table 2). (140)

Table 1. Comparison of the species of the subgenus Neoscolex Sokolskaja*

Character	S.(N.) macer Sokolskaja	S.(N.) levanidovi (Sokolskaja)	S.(N.) sokolskajae Morev	Styloscolex (N.) sp.
Secondary annulation of anterior segments	from IV	from IV	from IV	?
Pharynx	in II–III	in II–IV	in II–III	in II–III
Chromophil cells	in III–IV	in III–IV	?	in III–V
Chloragogue tissue of intestine	from beginning of V	from end of V or beginning of VI	from V	?
Postseptale of anterior nephridium	in VII	in VII	in VII	in VI
Thickness of layers of body wall in XV (μm):				
epidermis	8.8	8.6–17.2	7.2	
circular muscles	4.4	4.3–6.5	5.4	?
longitudinal muscles	13.2	8.6–17.2	3.8	
Location of clitellum	1/n VII–X	VII–1/n XI	1/n VI–XII	VII–X
Genital pores:	in the line of the ventral setae in all the species			
male	on VIII behind bundles of setae	on VIII behind bundles of setae	on VII behind bundles of setae	on VIII in intersegmental furrow VIII/IX
female	in intersegmental furrow IX/X	in intersegmental furrow IX/X	in intersegmental furrow VIII/IX	in intersegmental furrow IX/X
Testes	in VIII	in VIII	in VII	in VIII
Ovaries	in IX	in IX	in VIII	in IX
Atria	in VIII–X	in VIII–XII	in VII–IX	in VIII–IX
length (μm)	382	1400–2500	517–1265	328
diameter	146	129–272	132–232	129
thickness of muscular layer of wall	2.2	26–47	22–26	4.3–6.5
Diameter of vasa deferentia (μm)	35	18–22	24	30
Cuticular penial tubule	none	present	none	none
Spermathecae	2 pairs in VI and VII	1 pair in VII	1 pair in VI	1 pair in VII
ampulla	sacciform	sacciform	ovate	sacciform
duct: diam.	35–40	39–66	–	–
thickness of wall	9–13	13–26	–	–
Size of body, mm:				
length	fragments	up to 20	30–60	fragments
max. diameter	–	0.7–1.4	1.3–2.5	1.0
Number of segments	–	59–64	60–80	–

*Roman numerals denote ordinal number of segments.

Table 2. Distribution of Tubificidae and Lumbriculidae species in the areas studied on the Chukchi Peninsula

Species	Egvekinot	Zaliv Svobodnyi	Egvekinot–Iul'tin highway					Iul'tin, Teplyi klyuch R.	Lake Iona basin	Loren R.	Lavrentiy settlement	Area of Chaplino lakes
			1.5 km	105–108 km	103 km	105 km	108 km					
Fam. Tubificidae												
Rhyacodrilus svetlovi Sok.	–	–	–	–	–	+	–	+	+	–	+	–
Rh. coccineus (Vejd).	–	–	–	–	–	+	–	–	–	+	+	+
Alexandrovia ringulata (Sok.)	–	–	–	–	+	+	+	–	+	–	+	+
Fam. Lumbriculidae												
Lumbriculus olgae Sok.	–	–	–	–	–	+	+	–	–	–	+	–
Trichodrilus itchaensis Sok.	+	+	–	–	–	–	+	–	+	–		–
Stylodrilus (B.) chukotensis Sok	–	–	–	+	–	+	–	–	+	+	–	–
Styloscolex (N.) macer Sok.	–	–	–	–	–	–	–	–	–	–	–	–
S. (N.) levanidovi (Sok.)	+	–	+	–	–	–	–	–	–	–	–	–
Styloscolex (N.) sp.	–	–	–	–	–	–	–	–	–	–	–	–
Rhynchelmis sp?	–	+	–	–	–	–	–	–	–	–	–	–
Lumbriculidae g. sp.	–	+	–	+	–	–	–	–	–	–	–	–

Rh. svetlovi, found in the Lavrentiy stream, the Lake Iona basin (channel from Lake Iona, Ioniveyem R. channel, Goryachiye klyuchi), the tributary of the Amguema R. on the 105th km of the Egvekinot—Iul'tin highway and in the Teplyye klyuchi R. (Iul'tin settlement), is confined to water bodies with favourable temperature conditions. (141)

L. olgae, which for now is known from two mutually distant points (Lavrentiy settlement and the 105-108th km stretch of the Egvekinot—Iul'tin highway), is apparently quite common on the peninsula.

Two other endemic species have a local distribution. One of these, S.(N.) macer, is found only in the stream at the Lavrentiy settlement, and is apprently rare. The other, S.(N.) levanidovi, is found on the outskirts of Egvekinot (Geologicheskiy and Nyrvakinotveyem creeks) and on the adjacent stretch of the highway (13th km). This species, which is almost the only one in Egvekinot waters, determines the numbers and biomass of oligochaetes in this area, which, according to V.Ya. Levanidova (1976), reach substantial levels (Geologicheskiy creek, 1 July 1972: numbers - 76±42 specimens/m^2, biomass - 0.42±0.20 g/m^2; Nyrvakinotveyem creek, 21 July 1973: numbers - 723±155.4 specimens/m^2, biomass - 3.39±0.44 g/m^2). S.(N.) levanidovi is the only oligochaete species inhabiting the cold-water Geologicheskiy creek which freezes through in winter.

The morphological characters of the male gonoduct in Rh. svetlovi and the location of the gonads in S.(N.) levanidovi permit us to regard them, together with S.(N.) macer, as the oldest species among the Chukchi oligochaetes. Their distribution in the water bodies of the peninsula gives grounds for regarding the first as a thermophilic relict, and the second as one of the most cold-resistant species. The coexistence of the two in the fauna of the Chukchi Peninsula reflects the history of the region, which is characterized by the alternation of warm and cold climatic stages.

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